

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of fabricating an SOI wafer comprising:

an insulating film formation step of forming an insulating film on a first main surface of at least ~~either~~ one of a first substrate[[,]] and a second substrate composed of silicon single crystal;

a separatory ion implanted layer formation step of forming a separatory ion implanted layer by implanting ions from ~~the~~ an ion implantation surface on the first main surface side of the second substrate;

a bonding step of bonding the second substrate having the separatory ion implanted layer formed therein and the first substrate while opposing the first main surfaces with each other, and placing the insulating film in between;

a separation step ~~succeeding the bonding step,~~ of separating a bonded silicon single crystal film, later becoming an SOI layer, from the second substrate at ~~the~~ a position of the separatory ion implanted layer, the separation step forming a separation surface of the bonded silicon single crystal film with a roughness (Rms) of 4.5 nm or less; and

a planarization step of planarizing having the separation surface side of the bonded silicon single crystal film so as to produce the SOI layer,

wherein, in the separatory ion implanted layer formation step, a depth of formation of the separatory ion implanted layer measured from the ion implantation surface is adjusted through a magnitude of ~~the~~ an ion implantation energy in order to adjust a thickness of the bonded silicon single crystal film depending on a thickness of the SOI layer to be obtained, and a dose of the ion implantation is set smaller as the depth of formation of the separatory ion implanted layer measured from the ion implantation surface becomes smaller.

2. (Currently Amended) The method of fabricating an SOI wafer as claimed in Claim 1, wherein the planarization step further comprises a polishing step of polishing the separation surface side of the bonded silicon single crystal film.

3. (Original) The method of fabricating an SOI wafer as claimed in Claim 2, wherein, in the polishing step, polishing stock removal of the separation surface side of the bonded silicon single crystal film is set smaller as surface roughness of the separation surface of the bonded silicon single crystal film becomes smaller.

4. (Original) The method of fabricating an SOI wafer as claimed in Claim 3, wherein the dose of the ion implantation is set smaller, and the polishing stock removal, in the polishing step, of the separation surface side of the bonded silicon single crystal film is set smaller, as the thickness of the SOI layer to be obtained becomes smaller.

5. (Previously Presented) The method of fabricating an SOI wafer as claimed in Claim 1, wherein the insulating film is a silicon oxide film.

6. (Previously Presented) The method of fabricating an SOI wafer as claimed in Claim 2, wherein the insulating film is a silicon oxide film.

7. (Previously Presented) The method of fabricating an SOI wafer as claimed in Claim 3, wherein the insulating film is a silicon oxide film.

8. (Previously Presented) The method of fabricating an SOI wafer as claimed in Claim 4, wherein the insulating film is a silicon oxide film.